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# APPLE INDUSTRY OF THE U.S.

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SOME INTERESTING ASPECTS  
OF THE  
APPLE INDUSTRY  
OF THE UNITED STATES

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## B I B L I O G R A P H Y.

### BOOKS.

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DIRECTORIAL

THE DIRECTOR OF THE BUREAU OF THE CENSUS

WASHINGTON, D. C.

DEPARTMENT OF COMMERCE

OFFICE OF THE DIRECTOR

WASHINGTON, D. C.

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Atwell, Homer C. Co-operation Among Fruit Growers.

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Fletcher, S. W. Three Problems in Virginia Fruit Growing. Presented at the summer meeting of the Virginia State Horticultural Society.

July, 1913.

Gilbert, H. M. From Fruit Grower to Consumer. Proceedings of the 9th annual meeting of the Washington State Horticultural Association.

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Gould, H. P. Some Comments about Present Status of the Fruit Industry.

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February, 1911.

Kains, M. F. Co-operation.

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Loomis, E. P. The Sulzer Grading and Packing Law.

Report of the 17th annual session of the Virginia State Horticultural Society.

March, 1913.

1. The first part of the report is devoted to a general description of the project and its objectives.

2. The second part of the report describes the methodology used in the study.

3. The third part of the report presents the results of the study.

4. The fourth part of the report discusses the conclusions of the study.

5. The fifth part of the report contains the references used in the study.

6. The sixth part of the report contains the appendixes.

7. The seventh part of the report contains the summary.

8. The eighth part of the report contains the acknowledgments.

9. The ninth part of the report contains the list of figures.

10. The tenth part of the report contains the list of tables.

11. The eleventh part of the report contains the list of abbreviations.

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13. The twelfth part of the report contains the list of references.

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15. The thirteenth part of the report contains the list of figures.

16. The fourteenth part of the report contains the list of tables.

17. The fifteenth part of the report contains the list of abbreviations.

18. The sixteenth part of the report contains the list of references.

19. The seventeenth part of the report contains the list of figures.

20. The eighteenth part of the report contains the list of tables.

21. The nineteenth part of the report contains the list of abbreviations.

22. The twentieth part of the report contains the list of references.

Waggoner, S. J. The Benefit of Advertising.

Waugh, F. A. Can We Sell Our Apples.

CORRESPONDENCE, with

Department of Agriculture, Ottawa, Canada.

Department of Agriculture, Washington, D. C.

International Apple Shippers' Association.

Rochester, New York.

Massachusetts Agricultural College.

Amherst, Mass.

Missouri State Board of Horticulture.

North Pacific Fruit Distributors.

Spokane, Washington.

Northwestern Fruit Exchange.

Portland, Oregon.

University of Missouri.

Columbia, Missouri.

University of Wisconsin.

Madison, Wisconsin.

MEMORANDUM FOR THE SECRETARY OF THE ARMY

DATE: 10/10/44

COMMITTEE ON THE ARMY

REPORT OF THE COMMITTEE ON THE ARMY

IN THE HOUSE OF REPRESENTATIVES

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## O U T L I N E.

### A. THE RAISING OF APPLES.

1. Development of Scientific Methods.
2. Varieties.
3. Number of Trees and size of product.
4. Legislation.
  - a. Crop Pest Law.
  - b. Sulzer Bill.

### B. THE MARKETING OF APPLES.

1. Co-operative Organizations.
  - a. Eastern.
  - b. Western.
    - (1) N. P. F. D.
    - (2) N. F. E.
    - (3) I. A. S. A.
2. The Markets.
3. Exports.

### C. THE OUTLOOK FOR THE FUTURE.

C U I L I N

THE RAILING OF APPLES.

1. The Railing of Apples.

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## SOME INTERESTING ASPECTS OF THE APPLE INDUSTRY OF THE UNITED STATES.

A survey of the apple industry of the United States is a large and comprehensive subject. To attempt to summarize in a few pages what has as yet not even been done in book form would be an impossibility. Books and articles have been written on different phases of the subject, but the task of making a complete survey of the industry is as yet undone. It is a subject that would cover practically the whole country, one on which it is difficult to obtain accurate information, and one which is changing continually. Some aspects of it, however, are of special interest to the consumer who considers the apple part of the normal diet, and yet, on account of present prices, rather a luxury. Such information as I have acquired, and more, is gladly furnished by the Department of Agriculture at Washington, the State Experiment Stations, the State Horticultural Societies, and the co-operative organizations.

There is probably no branch of agriculture that has developed in the past 20 years under such impetus as has the fruit industry. 50 years ago the small quantity produced was largely used for the manufacture of wine and cider, but now fresh and canned fruit are among the staple articles of diet. This great advance in commercial fruit growing, and especially commercial apple growing, is largely due to the extended use of scientific methods. As long as little care was taken of the trees, people did not wish to eat the unattractive diseased

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

THE REACTION OF HYDROGEN PEROXIDE WITH  
HYDROLYZABLE POLYMERIZATION PRODUCTS  
IN AQUEOUS SOLUTION

BY  
J. H. HARRIS  
AND  
J. E. HARRIS

RECEIVED  
MAY 15, 1964

ABSTRACT

The reaction of hydrogen peroxide with hydrolyzable polymerization products in aqueous solution has been studied. The reaction is first order in hydrogen peroxide and first order in the polymerization product. The reaction is catalyzed by the presence of a small amount of a transition metal ion.

INTRODUCTION

fruit.] Within those 20 years great strides have been taken until now the apple as we buy it is much nearer perfection. All apples, however, are not perfect, and what the growers are working hardest for now is to attain the level where all apples shall be free from disease and blemish, and of fine color and shape, and properly packed and sold at a moderate price.

The operation of spraying for insect pests and fungus diseases has been almost universally adopted in a remarkably short time, more so in the East than in the West where these pests have not been allowed to gain much headway. The West has used prevention and the East has had to use cure and prevention. Experiment stations, especially in New York State, have made many experiments on the culture of apple trees and their reports have greatly aided the growers. As a result of one set of plantings New York showed that in the average soil commercial fertilizers are not necessary, if tillage and good care are the rule, and occasional doses of stable manure ~~to and~~ cover crops are given. The reason given is that trees grow slower than field crops and take up more water and consequently more material. Also only a small part is removed in the fruit, and the leaves return to the ground again. By good tillage and the solvent action of the decaying crops the unavailable material in the ground is made available. Where fertilizers are needed, the ground is usually unfavorable in other ways also, and failure will often result. Similar comparative experiments showed that tillage, besides making food available, supplies the tree with water by preventing evaporation. Many trees do grow well



in sod, but not because of it, but in spite of it. Other experiments showed that field crops, a small portion of which are plowed under, can be grown among the trees and thus pay for the use of the land until the orchard is bearing, and also benefit the trees. The West uses these cover crops very extensively. These tests are all made to aid the growers in raising their fruit in the best and most economical way. A tree is pruned to make it shapely, so that the sun can get in, so that thorough spraying can be done, so that the fruit can be gathered easily and to remove diseased wood. Most of the best orchards do hand picking, and sorting and packing by hand or machinery. Fruit growers do not agree as to the best methods of spraying, pruning or picking, but they do agree that some good method is necessary and it must suit their orchard and its location.

[Most people would be surprised to know how many varieties of apples there are. The U. S. Department of Agriculture has published a bulletin containing the names of the known varieties referred to in American publications from 1804 to 1904. This list contains approximately 14,800 names, of which 6,700 are distinct varieties, the remaining 8,100 being synonyms. Sometimes one variety will have 40 names. Besides this list there are given 376 accredited varieties of crab apples with 225 synonyms. At present the American Pomological Societies' recommended list contains 319 varieties of apples and 32 of crab apples. Of these, about ten varieties probably constitute 75 - 90% of the commercial apples, and they are all

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varieties over 50 years old. Such familiar names as Baldwin, Ben Davis, Jonathan, Northern Spy, Greening, and Yellow Newtown greet us. ] As yet the different states do not produce special varieties although the West does not attempt Eastern ones. The growers are anxious to produce more specialization as to varieties, and yet it is for their benefit to raise both winter and summer <sup>apples</sup> varieties, thus distributing their labor. With a small number of varieties on sale the consumer could easily learn what she likes and its season.

During the period from 1890 to 1900 apple growing took its biggest jump. It was during this decade that spraying was being universally adopted, and the number of apple trees in bearing increased 68%. In 1900 of the total number of fruit trees reported, 55% were apple trees and they produced 83% of the total number of bushels of fruit. In 1896 we had our record crop of 207,000,000 bushels of apples. Such a year as this in which all regions produce a full or normal crop is exceptional. Since 1900 the number of trees and the production has been falling off in spite of the great extension of apple orchards. In 1910 the census figures showed a decrease of 33.4% in acreage. This decrease is probably due to the cutting down of the poorer orchards to give way to other products and to new trees which have not yet borne fruit. While the number of trees decreased <sup>in bearing</sup> about 50,000,000 as compared with 1900, the number of trees not yet bearing was about 65,000,000. While in 1839 the production was 143,105,689 bushels, it rose in 1899 to 175,397,600 bushels, but fell in 1909 to 147,522,313 bushels. It seems to be still





falling for in 1912 it was only about 120,000,000 bushels. What the effect of these new acres of scientifically set out trees will be remains to be seen, but a rise in production is generally expected.

There seems to be more specialization now as to which parts of the country shall raise apples, altho every state has some apple trees. Let us compare a few of the states. The 1890, 1900, and 1910 censuses give the production of apples in the year preceeding, and this of course may be affected by weather conditions, but is as accurate as such figures ever can be. Take Ohio, which in 1889 led in the number of bushels produced, in 1899 was thirk in rank and in 1909 was tenth. Then New York which in 1889 was seventh, in 1899 <sup>and</sup> ~~to~~ 1909 was first, in the latter year producing 25,409,324 bushels, which was twice as much as Michigan, which came next with its 12,332,296 bushels. Some of the States, as Iowa, show a fewer number of trees in 1910 than in 1900 but a production twice as large. Oregon and Washington more than doubled their production with about the same number of trees. The yield obtained seems to have little relation to the actual number of trees. Missouri leads in the number of bearing trees in 1910 but comes fourth in the number of bushels produced. New York had 3,000,000 less <sup>than Missouri</sup> trees but produced 15,000,000 more bushels. This shows pretty well the difference between orchards where scientific methods are used and where they are not. The Missouri State Horticulturist considers that 80% of the orchards in that state had no



scientific care and the other 20% only slight. It is the middle West and West which are setting out the large number of trees. Virginia, West Virginia, New York, and Pennsylvania are the only Eastern states which have so far considered the apple as important commercially, altho some of the small states have a large number of trees compared to their area. Massachusetts has its orchards but they are decreasing in number and in production. The States which lead in products in 1909 were New York, Michigan, Pennsylvania, Missouri, Kentucky, Iowa, and Ohio. Washington and Oregon do not stand high in their product at present, but it is high compared to the number of trees, and they each had in 1910 as many trees again not yet of bearing age. In an average made by the U. S. Department of Agriculture of a possible full crop, Oregon in 1912 had 96% of quality and 82% of quantity, and in 1913 98% of quality and 100% of quantity. This was the highest percentage ever obtained in any section.

The size of the apple orchards vary in different states and within a state. In Oregon and Virginia they average from 5 to 500 acres. In Missouri the average size of 14,645 orchards was 8 acres, but there were 83 of over 100 acres. The largest orchards require a great deal of care and are usually those owned by rich business men and corporations. Those of about 30 acres are the most convenient size and give an income under scientific care of anywhere from \$100 to \$800 an acre.]

There has been very little legislation in this country concerning the apple industry. The different states have passed a few laws about spraying. Virginia was one of the first, with

U.S. DEPARTMENT OF THE INTERIOR

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its Crop Pest Law in the early nineties, which has been the basis for similar laws in a number of states. It has contributed more to the development of commercial fruit growing in that state than almost any other factor. The basis is nursery inspection and the inspection of orchards. The inspector can order diseased trees cut down if the grower will not spray them, but this compulsory treatment is seldom enforced. It is in fact seldom needed. The law works <sup>then</sup> ~~their~~ education by the inspectors of the nurserymen and growers, and has proved that it is better to lead than to drive. The eastern laws are not as drastic as the western ones, but the western ones suit their conditions and would not fit ours. They are largely to prevent the introduction of pests, hence must be more drastic. Our eastern laws were framed with full recognition of the fact that nearly all serious orchard pests are now spread throughout the East, and the only sensible recourse is to educate the growers to cope with the pests themselves, coupled with thorough inspection of nurseries, the chief centres of dissemination. The principal national law is in regard to packing. The standard pack, however, is not obligatory unless the stencil "U. S. Standard" is used on the package. Although the law allows many loopholes in its wording, it is a step in the right direction for a well packed box or barrel of good grade apples. It teaches the grower how apples should be sold. The size of a standard box and barrel are fixed, and the size of the apples. The "Firsts" must be more than  $2\frac{1}{2}$  inches in diameter if large ones and  $2\frac{1}{4}$  inches if small ones. Then each grade below is



1/4 inch less. This does not require that they shall all be 2 1/4 inches, but that is the minimum for that grade. Color has not usually been considered, but this law asks for good color and uniform, throughout the barrel or box. The apples must rank 95% perfect as to shape, color, smoothness and freedom from bruises and disease. Many new grading and sizing machines are now on the market, which when used, leave the packers free to watch the apples as they go along for blemishes and poor color. The more generally this pack is used, the higher will be the grade of apples on the market. The East uses the barrel almost wholly, and the West the boxes. With the growing demand for more house space boxes will be more generally used because they take up less room and can be purchased as needed. The average box contains about one bushel but is not sold that way but by the actual number of apples. The average barrel contains about three bushels.

[The Apple Industry consists of two parts. The first, which we have just dealt with, is the raising of fine fruit and the packing it suitably for market. The second part lies in the distribution of that fruit in such a careful and intelligent way that it will bring back to the producers the greatest value possible. One of the biggest problems to-day is this proper distribution of the apple crop. Every year there is a heavy rush of apples onto the market during September and October, giving the speculators, who can store them, an opportunity to make profit at the expense of the growers. If those apples could be stored until needed, the overflowing of the market





would be avoided. A better territorial distribution would be still more valuable. The entire commercial output is shipped to a few large cities, where it is stored and reshipped as it is ordered. As a result it is never spread very widely and many regions do not know the apple. If the crops were shipped directly to the different parts of the country without using the central markets, the area of apple consumers could be doubled. It is easily seen that what is needed for these fair returns to the grower and a wider market is co-operation among the growers. Within the last few years this has been developed to a considerable extent, especially in the West. In the East it has not spread very widely because the growers have easy access to the market and can get good prices without co-operation. The Eastern Fruit Growers' Association devotes most of its energies to legislation and freight rates. In the East most selling organizations have failed because the members do not work for each other. The large stock-holders try to make money out of the smaller ones. It is hard to organize an association, to find the right man to manage it, to make it strong enough to fight the buyers who are already organized, but chiefly to get the farmers to stick together. In every case where a farmer's exchange or association has been formed and succeeded, it has been because the farmers have been forced to get together. Without organization the growers have little knowledge of the market and are dependent on the commission men. If the growers hear that prices are high, they ship and may flood the market and get low prices from the wholesalers. To succeed there must



be sizeable shipments to the market continually and not spasmodically. If the growers agree to sell through the association and then some don't, the association will fail. A strong advantage in an organization is that it can establish packs, crates, and brands for all the members. Near Norfolk, Va. there is a farmer's exchange which is very loose in organization but it has succeeded. It tells its members which commission men to ship to in each city and then every day reports on the conditions in those cities, and in that way directing the shipments more or less. Other organizations have everything shipped through them and hold themselves responsible. If the same commission men are always traded with they will usually co-operate with the grower or the association, but an association is better able to regulate the supply, and demand fairness than an individual is. The East as a whole, however, has few organizations. Practically all states have Horticultural societies but they spend most of their time in discussion.

In the West co-operation has spread widely, especially in the Pacific North West. It has been applied to the selling of almost all products, as the markets are usually at a distance. In Montana, Idaho, Washington, Oregon and British Columbia there are 175 organizations and 45 of these are in Washington. If it were not for these, apples could not be shipped East. Most of the larger associations are composed of small local ones. Most of the organizations limit their membership to apple growers, and limit the amount of stock each may own <sup>or</sup> ~~as~~ their voting power. A capital is always required in order that the output



may be held back, if desired, for a year. As a rule the growers contribute the fruit and wait for the returns. They treat the association as the business end of their orchards. Boxes, paper, spray materials, etc., can be bought in large quantities from the cheapest source and sold to the members at reduced cost. Charges for handling are placed at such a figure per box that it pays the general running expenses. Such an organization is the Cashmere Fruit Growers Union in Washington, which has about 100 members.

The Hood River Organization was the first fruit growers association of the Northwest and was formed in 1893. Now the North Pacific Fruit Distributors handle most of the fruit of that valley. It has been estimated that that corporation handles 40% of the product of Washington. It is organized into 109 locals which are grouped into 8 sub-centrals and these are united in the Distributors. It is purely co-operative and is owned and controlled by the growers, who elect the officers. They contract their crops through the locals and so to the Distributors. This association deals with every variety of fruit in the Northwest. It has established uniform grade and pack which is strictly enforced. Every member has his crop estimated and inspected in the field and in the warehouse by the local inspectors. It is again examined by the sub-central and finally by the inspectors of the Distributors who go the rounds of the sub-centrals. Each grower markets his fruit under his trade name and pays the organization \$15 a carload for its services. It is simply a selling organization, but it can get correct



estimates of the crops and daily reliable information of the markets, thus regulating the supply and taking all the responsibility off the grower.

The Northwestern Fruit Exchange is an association for a similar purpose but has a different organization. It was started in 1910 and is a corporation, although a growers agency. The membership is of associations, not individuals, of which in 1912 there were 30. There is no membership fee, but shares may be bought by growers. Nine directors have general oversight and a growers' council composed of one representative from each association, meets and co-operates with the directors, giving estimates as to the probable crops, etc. It charges \$.10 on all f. o. b. sales, but any association may sell outside and retain 1/2 the \$.10 selling charge. Also it can refuse to sell at the price the Exchange offers. So far no dividends have ever been paid on the shares. The Exchange substitutes a trained sales organization for a too frequently untrained sales manager. It realized that in order to know the demand of the markets there should be a resident salesman in each city. In order to meet this expense it united with other non-competing organizations in the country to hire their salesman and formed the North American Fruit Exchange. In January, 1913, this system had 123 branch offices and employed 229 markets in the United States, Canada, Europe and the Orient. The Exchange lays great stress on f. o. b. sales. This is better for both the grower and the buyer. Under this system the fruit is sold before picked and there is less anxiety. When the buyer purchases in this way he

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has from one to three weeks to plan for its disposal and so it is worth more to him. It is also worth more to the grower because all the demand is still available as a market. This advance listing of goods saves time, and the grower's responsibility ends when the cars are loaded. In 1911 the Exchange averaged 24 days between shipment and payment for every car handled, and for one association 75% of its output was sold prior to harvest.

The International Apple Shippers Association takes up the question from the wholesaler's or commission men's side. It was organized in 1895 with 50 members which had increased this year to 550. Its object was not to affect prices, but to furnish reliable and accurate information to its members concerning the condition and extent of the apple crop in any one season, to encourage high grade fruit and good packing, and to spread advertising. They do not believe in doing away with the middlemen, naturally, but want better relations between the growers, the commission merchants and the retailers. This lack of harmonious relations helps to create uncertainty as to conditions and intensifies the gambling feature of the business. Crop reporting from growers' and dealers' organizations show direct antipathy of view point. So neither report is believed. What is needed is unbiased government reports from each state. Also if growers would stick to dealers and dealers to growers a feeling of mutual interest would arise. It is better to have a steady increasing market and low prices than an irregular market with extremes of prices. Co-operation all around is the



way to gain this end which the grower and buyer are seeking.

↑ The principal apple markets are New York, Boston, Chicago, and Philadelphia. The receipts for the year ending June 30, 1912 at Boston were 285,663 bbl., at New York 2,485,176 bbl. and for Chicago for the year ending June 30, 1913, 1,166,000 bbl. The Northwest and Idaho and Colorado ship perhaps 30.35% of their apples East as first class. The absolutely scientific orchards ship 85 - 90% of their crop. The rest is sold locally and along the Pacific Coast. It cost on an average, from Washington and Oregon to New York, \$.50 per 50 lb. box in a carload. From Virginia to New York about \$.18 per 100 lbs. Thus the cost plus the freight per box is approximately as high as the average price of the eastern apple per barrel within 200 miles of its markets. The average price received by the Western grower for the season 1913-14 was from \$1.00 to \$1.50 a box. The commission men usually get from 10 - 25% and the shipper 10%. Most of these apples sell for \$3.00 up a box. The reason the retailer gets this high price is because he has to take the risk of the apples spoiling on his hands, he has to buy and usually sell in small quantities, and he has to deliver. The retailers need to be educated more as to the varieties, seasons, storage and how to sell more. The market in New York is not located in one place. The fruit arrives at two different freight terminals. At Water Street it is sold directly from the car. A few barrels are taken out by the commission men to whom the lot is assigned and are examined by the buyers from the retail houses, hotels, etc. After the



different lots have been looked over the auction opens around one commission man's stand, continues until his lot is sold, and then moves on to the next. At the other terminal the fruit is taken to the salesrooms of the commission men. This lack of a central unloading and selling place is one of the chief drawbacks of the New York market.

Our exports in apples are relatively small compared with the amount produced. Out of 30 or 40 million barrels, one or two million is a small part. But even such a small foreign market may greatly relieve home pressure and serve as a "safety valve" for market conditions. To Canada in 1913 we sent 320,357 barrels, which required a duty of \$127,890.40.

The question which is being greatly agitated at present is the future of the Apple Industry. Whether with these extensive plantings and scientific methods the market will not be swamped and the industry no longer be a paying one. It was estimated that in 1910 there was an increase in the number of trees not of bearing age which would increase in a few years the number of those bearing 44%, and that in 5 years the crop will probably be three times that of 1912 or 300,000,000 bushels. But the number of trees is decreasing almost as fast as the new ones are increasing. Also some say that if one-third of the present plantings become commercial they will do better than plantings have ever done before. But, granting that better plantings are being made and this high figure is reached, the outlook is a bright one. First, our population is increasing faster than the output of apples.



Also at present 46% of it is a city population. These people can and ought to eat a great many more apples than they do at present. With the new Parcel Post system samples can be distributed, and also boxes which are ordered, thus doing away with the retailer. For this, extended and intelligent advertising is needed and must come in the near future.

Then our foreign market is broadening. Panama Canal will greatly affect the development of this, for water transportation is cheaper than rail. The eastern market will be left free for the eastern growers and the western apples will be shipped along the Gulf and to Europe and South America. Already one shipment has been sent, 15,000 boxes, at great expense, via New York & London <sup>to</sup> ~~and~~ Buenos Ayres. Thus a demand is being established in Argentine which can be supplied as soon as the canal is opened. The East has no line of boats going to Argentine that have refrigerator accommodations worth speaking of.

The market demands a cheaper apple. The average family cannot afford fancy grades. By making them cheaper the grower can increase the demand for his supply. He can make prices cheaper by improved methods and more use of machinery, by more utilization of the waste fruit for canning and drying, but chiefly by concerted action whereby they can get properly in touch with the consumers. Every housewife should learn the good points of the many varieties, and know when to buy them at their best. The retailers must learn when to put them on





sale. Co-operation all around is the way to increase the demand which the producer wants, and to lower the price which the consumer wants.

*Dorothy Richards Gore*

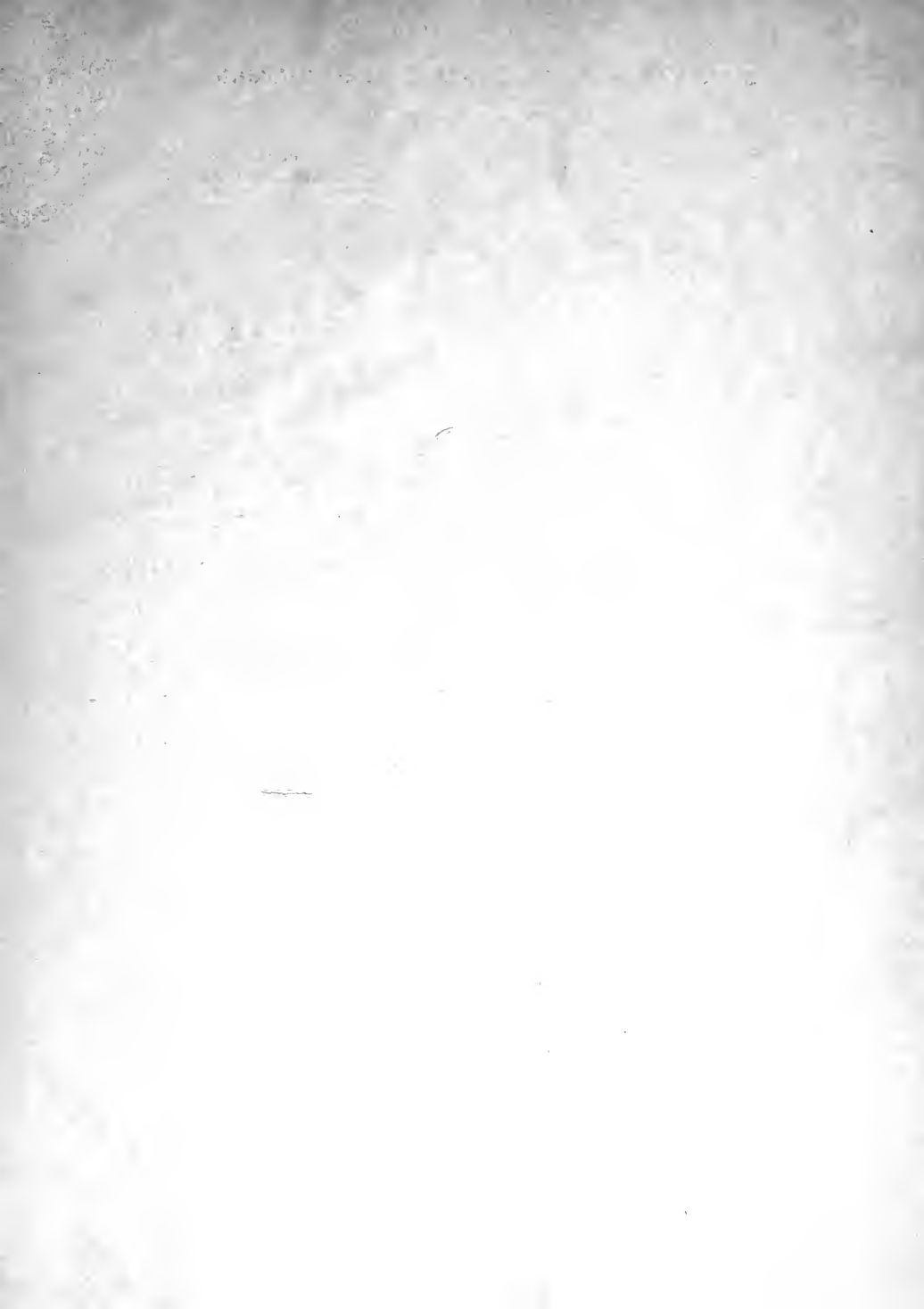
Simmons College, Boston.

May 7, 1914.

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*very much interested*

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MASSACHUSETTS AGRICULTURAL COLLEGE

DIVISION OF HORTICULTURE

FRANK A. WAUGH

*Head of Division of Horticulture  
Professor of Landscape Gardening*

Amherst, Mass., May 14, 1914.

Mr. Charles R. Green,  
Library.

Dear Green:

Of course I don't keep up a general correspondence with so many girls as you do, but one of them in Simmons College who has been writing me some interesting things lately has sent me a copy of her thesis in economics. She makes me a present of this and I know of no better way to handle it than to send it on to you. If you don't want it you may send it back.

Very truly yours,

*Waugh*











